



Federal Energy Regulatory Commission
Technical Conference:
Assessing the State of Wind Energy in Wholesale Electricity Markets
Docket No. AD04-13-000

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Thank you for the opportunity to participate on a panel today. Thank you also to the Commission for making wind power and transmission issues a priority.

Wind on the Wires has been involved for the past 3 ½ years on wind power and transmission issues, particularly in the technical and regulatory arenas and at the Midwest Independent System Operator (MISO). Our footprint covers seven Upper Midwest states, including the wind rich states of North and South Dakota. Wind on the Wires, in conjunction with the American Wind Energy Association, compiled the *Midwest Wind Development Plan* (Plan) for use in the Midwest Independent System Operator Transmission Expansion Plan 2003. MISO used the wind inputs from the Plan to run a High Wind Scenario and they are currently doing additional study on several transmission scenarios that looked economically promising in the expansion plan.

I realize that the conference today is focusing primarily on the West. The Midwest is fortunate to have a Regional Transmission Organization in MISO. So I'm going to take you through some real life, on-the-ground examples of how wind and transmission issues are being studied so that wind power can actively participate in the marketplace. These examples can serve as models for the West.

My comments today will encompass three areas:

1. a wind and transmission study underway by the Western Area Power Administration (Western) Upper Great Plains Region for the placement of 500 megawatts of new wind power in North and South Dakota that includes a task to analyze non-firm transmission potential relative to new wind generation;
2. the recently completed Xcel Energy and Minnesota Department of Commerce Wind Integration Study; and

3. accommodation for state energy preferences such as renewable energy.

First - the wind and transmission study underway by Western in the Upper Great Plains Region for the placement of 500 MW of new wind power in the Dakotas.

The first task in the study will be to analyze non-firm transmission relative to new wind generation. Western will study 3 key corridors and evaluate and compare what is currently administratively committed versus actual use across the 3 corridors using actual historical data. This task will help quantify for the 3 key corridors the risk of curtailment new wind generators would face should Western develop and offer a conditional firm transmission product. This is an important step in understanding the flexibility that may reside in the existing transmission system in these 3 key corridors. The entire wind and transmission study will be completed in the next year and fits nicely with the consideration of a new transmission product that has been talked about extensively today.

Second - the Xcel Energy/MN Department of Commerce Wind Integration Study.

The study took a technically rigorous look at a 15% wind penetration on Xcel Energy's system – 1500 MW of wind generation on the Xcel Energy system with a projected 10,000 MW of peak customer load in the year 2010. The study looked at the impacts of the variability of wind power on power system operation in the Midwest. The study applied sophisticated, science-based atmospheric models to accurately characterize the variability of Midwest wind generation.

The study was concerned with four time scales in monitoring operation of the power system: regulation, load following, scheduling and unit commitment. To look at the reliability impacts of 1500 MW of wind power on the Xcel system a concept called effective load carrying capability was used. ELCC is a measure of the capacity value of any generator. This method of measuring reliability has been applied to traditional power plants for many years, but is a fairly new concept when applied to wind.

So what did the study conclude?

1. The study concluded that 1500 MW of wind could be reliability integrated on the Xcel system. The study also concluded that 1500 MW of wind contributes 400 MW of effective load carry capability – that's 400 MW of reliability or 27% of nameplate capacity.
2. The study concluded that the cost of integrating 1500 MW of wind generation into the Xcel control area in 2010 is no higher than \$4.60 per MW hour of wind generation. The total cost includes \$0.23 per MW hour as the opportunity cost associated with an increase of 7.8 MW of reserve capacity to satisfy the regulation requirement; and \$4.37 per MW hour of wind generation attributable to unit commitment and scheduling costs.

3. The study concluded that these costs are conservative or worst case because the wholesale energy markets may provide a less costly alternative than using internal resources to compensate for the variability of wind, and these costs are based on current state of the art forecasting and scheduling and unit commitment techniques. These techniques should improve as experience with wind integration grows.

Third - I want to briefly mention several things that are critically important to accommodating a state's preference for renewable energy:

1. the MISO Regional Expansion Criteria and Benefits (RECB) Task Force work that will ultimately result in a filing with the Commission. The work needs to recognize that state policy on renewable energy is one factor driving transmission expansion (other factors include reliability and economics). However, there can be many beneficiaries from transmission constructed to deliver renewable energy, and this needs to be ultimately reflected in the RECB work and filing with the Commission.
2. the ability to do group studies. I am pleased that the Commission reconsidered this issue in its Order on Rehearing, Clarification, and Compliance Filing issued October 28, 2004 in Docket Nos. ER04-458-002 and ER04-458-003. The "group study" approach to queue processing is particularly critical in the Upper Midwest for wind power.
3. the need to work on allocation of new transmission capacity. A methodology needs to be developed for allocating new transmission capacity across the seam in the MAPP/MISO area between market participants and non-market participants. The only work currently underway at MAPP/MISO is the allocation of existing transmission capacity across the seam. Resolution of this issue will be important for wind development in the Dakotas that wants to deliver east into the MISO market.

In summary, I would recommend that the FERC:

1. Closely follow the results of the Western wind and transmission study, particularly the results from Task 1 on analyzing non-firm transmission potential on 3 key corridors;
2. Identify best practices to quantify wind capacity value; and
3. Continue to ensure that policies and processes put in place accommodate a state's preference for renewable energy such as wind power.

Thank you.